CYSTOSCOPY IN CHILDREN

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It has not been many years since cystoscopy in adults was considered a difficult procedure, to be undertaken only when other diagnostic means had failed. This was due, in part, to the scarcity of experienced operators and largely to the imperfections of the instruments with which they had to work. The revolutionary changes that have resulted from the intelligent co-operation of ingenious workers and skillful instrument-makers, both here and abroad, are so well known that, today, but few adult patients are denied the advantages of modern urologic methods when they are needed. It yet remains to popularize (if we may use the term) the application of these same principles, with certain necessary modifications, to infants and children. The combined use of the x-ray, the cystoscope, and the examination of catheterized specimens of urine, with pyelography, estimation of kidney function, ureterography, cystography, and blood chemistry, has placed adult urology on a basis so firm that the diagnostic error is smaller perhaps than in any other branch of surgery. These measures are alike applicable to infants and children, with the addition usually of a general anesthetic and the occasional necessity of a meatotomy in both boys and girls, and sometimes an external or internal urethrotomy in male infants. We have not yet found it necessary to do an external urethrotomy to gain access to an infant male bladder.

Disorders of the urinary tract, both congenital and acquired, are being found in children more and more frequently as we develop our technic and suitable instruments become available. But few textbooks include this subject, and until recently but little literature had been published. Nitze, in 1907, described cystoscopy and catheterization of male children as young as eight years; employing external urethrotomy in younger cases requiring an examination. Portner, in 1908, reported successfully cystoscoping boys of two years of age with a No. 12 French observation instrument. At the same time he developed a catheterizing cystoscope of No. 17 Fr. caliber, with which he was able to catheterize the ureters in a boy of eight years. These instruments had unnecessarily long shafts and were too flexible to be satisfactory. On account of the mobility of a child's bladder, making an excursion with each respiration, it is difficult to keep the landmarks in view with a long instrument, and flexibility tends to misalignment of the lenses. The two instruments made, at the direction of Edwin Beer and described by him in 1911, had neither of these faults and were thoroughly practical and useful. The smaller, which he found better for use in small boys, was 15 millimeters in circumference, with a shaft of 9½ centimeters, while the larger was 18 millimeters in circumference, with a shaft of 12 centimeters. By attaching a catheter tunnel, each of these could be converted into a single catheterizing instrument carrying a No. 4 or 5 catheter. Hyman, in 1918, reported cystoscoping more than thirty children under nine years of age, the youngest being a boy of seventeen months. He also emphasized the fact that young children bear genito-urinary surgery well, and mentioned a nephrectomy performed by Kakels on an infant six weeks old who had an uneventful recovery. Stevens has catheterized both ureters in a girl of twelve months, using a Wolff 16 Fr. instrument, and he calls attention to the fact that Kretschmer and Helmholz did the same for a female child of seven months, with an 18 Fr. cystoscope, stating that the urethra in this case was unusually large. In Hinman's series of twenty-six children reported in 1919, the youngest boy was three years and the youngest girl eleven months old.

Every disease or surgical lesion found in the kidneys or ureters of adults, and most of those seen in the remainder of the urinary tract, may occur in children, and it is essential that the physician and the pediatrician, who see these little sufferers first, should attach sufficient importance to urinary symptoms in children. Instead of being a "bad habit," enuresis may be due to the presence of a calculus or be the first symptom of a renal tuberculosis. Conditions that appear trivial may be the basis for serious urinary disease in later life, and while one should first employ other diagnostic aids, as urinalysis of catheterized bladder urine, palpation of kidneys and bladder, x-ray of entire genito-urinary tract and cystography, before subjecting a small child to cystoscopy, if either anesthesia or urethrotomy, or both, must be utilized, these should not be considered contra-indications to its use and should not stand in the way of the information to be derived from the use of the cystoscope. Practically the only element of danger is the renal suppression that may follow pelvic lavage in badly diseased kidneys and this can be avoided by a total 'phthalein functional test, which should always be done before lavage, and refraining in cases that show a very low output of the dye. The various functional tests and blood chemistry findings conform closely to those made in adults.

In little girls, except for an occasional meatotomy, one can usually succeed in introducing a 16 Fr. or 18 Fr. single catheterizing instrument. The new Brown-Buerger 16 Fr. cystoscope has all the advantages of the larger instrument, in that it is now both catheterizing and irrigating. For observation work alone, the instrument made by a German firm, with Zeiss lenses and size 14 Fr., and now being used as a naso-pharyngoscope, is very satisfactory. Where the single catheterizing instrument is used, and it is desirable to catheterize both ureters, the instrument may be withdrawn, leaving a catheter in one ureter, reintroduced, and a second catheter passed in the other side. We have catheterized both ureters in a girl of five years with local anesthesia and have found that a strip of small umbilical tape, soaked in novocaine solution and introduced as far as the bladder-neck with a probe, is a better means for securing the anesthesia than injecting the solution or using cotton swabs. The bladder should be emptied of urine beforehand, else the child may void and wash the novocaine away. As Edwin Beer has remarked, the lower bowel should be emptied with an enema before beginning the cystoscopy "for obvious reasons." Care must be taken not to overdistend these little bladders, and it is better to in-

ject the irrigating fluid with a syringe, rather than from a wall irrigator, as is ordinarily done in adults. This is especially true when there is a cystitis present. We do not distend the bladder with air.

It is sometimes possible, when the lesion is in the kidney, to dispense with catheterizing the ureters by employing chromo-ureteroscopy with Indigo-Carmine and comparing, not only the time of the appearance of the dye from the two orifices, but the intensity of the blue color and the expulsive power as well. An injection, deep into the muscle of 5 cc. of a 0.4 per cent sterile solution of the dye is given fifteen minutes before the cystoscope is introduced.

Our most gratifying results have been in the chronic, recurring pyelitis of little girls, usually found on the right side and most often caused by the colon bacillus, we have employed pelvic lavage with silver nitrate, from 0.5 to 3 per cent, not oftener than five days apart, and the improvement, both clinically and from the urinary findings, has been at times spectacular. One little girl of four years, with a history of pus in the urine for a year and all other symptoms of chronic pyelitis, who had been treated repeatedly with alkalies, had a colon bacillus infection in the right kidney, with the urine from that side filled with pus and bacteria. One lavage with 0.5 per cent silver nitrate rendered the urine pus-free and negative to culture, and caused her to gain two pounds the first week thereafter.

Cystoscopy in children is safe, rational and feasible, regardless of the age or sex, and at times is absolutely essential for an accurate diagnosis and proper treatment. It is not a thing to be done thoughtlessly, but it should not be neglected when indicated. The important thing is to recognize the necessity for it and then to do it.

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DISCUSSION

Anders Peterson (Medical Office Building, Los Angeles)—I am convinced that cystoscopic examinations should be done in children more often than is our practice at the present time. The main reason in the past for the failure in carrying out this work was the lack of suitable cystoscopes. With the development of the newer cystoscopes this can no longer be an excuse. Another reason is the fact that the examination is more difficult to perform both from the standpoint of the actual manipulations in the smaller subject, and also that a general anesthesia is required in nearly all children. Under general anesthesia the child's bladder makes rapid excursions of considerable degree during each respiratory movement, rendering both satisfactory vision and catheterization of the ureters difficult.

The indications for cystoscopic examinations in children are the same as in adults: Pyuria, hematuria, pain, obscure abdominal masses and suspicious x-ray shadows, either alone or in combination, are the general indications for such examinations.

Wright has emphasized the importance of a careful preliminary study, including catheterized specimen of the bladder urine, combined kidney function tests, and x-ray plates. When these measures are taken, the actual cystoscopic examination can be performed with the minimum amount of manipulation and time.

Robert V. Day (Detwiler Building, Los Angeles)—If these little patients are given adequate urologic consideration, oftentimes we find the same pathologic processes that exist in the upper urinary tract of the adult. I have found the following kidney conditions in children: Sarcoma, tuberculosis, complete duplication of one ureter, stone, pyelitis, and hydronephrosis. Moreover, congenital stricture of the anterior urethra or meatus in both male and female infants, as well as congenital valve in the male posterior urethra, have been observed, the stenosis of the urethra being not uncommon. One does not mean to say that we should subject every child with pyelitis to cystoscopy and ureteral catheterization. However, if infections or urinary symptoms of any kind persist, urologic study should be made and there are scarcely any more contra-indications than in the adult. Cystoscopy in infants is quite as simple as the same procedure in the adult with two exceptions, namely, necessity for anesthesia and the small calibre of many urethras. These difficulties may be overcome by the methods suggested by Wright. I have even used caudal anesthesia in a female child of eight. This, however, was possible only because she was highly intelligent and we had her confidence. Small-sized instruments have been so wonderfully constructed and perfected (the best in the world, by American manufacturers) and there have been trained such an abundance of capable urologists, available in every sizable city, that hardly any excuse exists for the continued neglect seen in the past. Wright has made a real contribution, and it is to be hoped that general practitioners and pediatrists will take advantage of opportunities for the accurate diagnosis and treatment of these cases.

It is amazing to observe how, in certain cases, one or two treatments will clear up infections in children, especially when due to some mechanical obstruction. Obstruction in the urethra may cause at times dilatation and hydronephrosis and at others true nephrosis. In a Japanese girl of eleven, with urine of light color, low specific gravity, clear, with a large amount of albumin and a few hyaline casts—in other words, the so-called parenchymatous nephritis of the older authors—we found an urethra through which only a No. 6 ureteral catheter could be passed. By dilatation the urine became almost albumin-free and the patient showed marvelous improvement as long as she was under observation. Another child, who had been treated for pyelitis for three months in the Children's Clinic, cleared up in a few days following dilatation of a stenosed urethra and catheterization with the cystoscope and drainage of both ureters of a double kidney on the left side. Other equally startling results are sometimes obtained.

William W. Happ (Pacific Mutual Building, Los Angeles)—Until recently the urologic disorders occuring in infancy and early childhood have been much neglected, owing chiefly to the technical difficulties encountered. With the improvement in technic there has been opened up a large field for study, and with the co-operation of the pediatrician and the urologist much can be accomplished.

Of great interest is the question of pyelitis in infants and children, occurring chiefly in girls, and very resistant to medical treatment, owing to its tendency to recurrence. It is important that these patients be studied to determine, first, the type of the lesion; second, whether it is unilateral or bilateral; and third, what the end-result of these repeated renal insults are. Do these kidney infections in childhood clear up entirely or are they responsible for definite symptoms later in life? It is only by careful cystoscopy that these points can be determined and careful local treatment instituted.

While it is true that a general anesthetic is usually necessary, nevertheless the results accomplished justify the procedure, provided that it be not attempted at too frequent intervals.